New Source Review (NSR): Applicability and Rule Revisions

Jim Little

U.S. EPA, Region 4

404-562-9118,
little.james@epa.gov

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NSR Applicability

Attainment Areas and Nonattainment Areas

- National ambient air quality standards (NAAQS) for six pollutants (referred to as criteria pollutants): carbon monoxide, lead, ozone (ground level), nitrogen dioxide, particulate matter ($PM_{2.5}$ and PM_{10}), sulfur oxides.
- Nonattainment area: a geographic area where ambient air quality concentrations exceed NAAQS for one or more criteria pollutants.

Attainment Areas and Nonattainment Areas (cont'd)

- Attainment area: a geographic are where ambient air quality concentrations comply with NAAQS for one or more criteria pollutants.
- Hence, pollutant-specific: same geographic area can be a nonattainment area for one or more criteria pollutants and an attainment area for the other criteria pollutants.

New Source Review (NSR) Overview

- NSR is a construction permitting program for new and modified emission sources.
- Major source NSR permitting includes prevention of significant deterioration (PSD) permitting for attainment areas and nonattainment area permitting for nonattainment areas.

New Source Review (NSR) Overview (cont'd)

- Pollutant-specific: same project can be subject to both PSD and nonattainment area permitting requirements.
- NSR also encompasses minor source construction permitting.

Role of State and Local Agencies (S/L's)

- S/L's have primary responsibility for attaining and maintaining compliance with national ambient air quality standards.
- S/L's generally are the permit-issuing agencies (reviewing authorities) for major and minor construction and operating permits. Region 4 has 8 state and 10 local reviewing authorities with major source permitting authority. EPA is generally in an overview role for major construction and operating permits.

NSR Reviewing Authorities (Permitting Agencies)

- Delegated vs. SIP-approved.
- All 18 NSR reviewing authorities in Region 4 have SIP-approved programs (with one partial exception).
- Theoretically, the same major source NSR permit requirements apply to all programs; EPA encourages consistency among the programs. Minor source permit requirements differ from program to program.

NSR Regulated Pollutants

- Will discuss in more detail later under NSR rule revisions.

PSD Permitting: Major Source Thresholds

- Major new sources –
  - 28 source categories: 100 tpy of any NSR regulated pollutant.
  - Other sources: 250 tpy of any NSR regulated pollutant.
- Major modification of a major source –
  - Significant net emissions increase of a regulated pollutant: 40 tpy sulfur dioxide, etc.

PSD Permitting: Major Modification Applicability

- A modification is a physical change or change in the method of operation.
- Step 1 - Assess emissions increases due to change. Include emissions increases due to debottlenecking and/or increased utilization.
- Step 2 - If emissions increases are “significant,” perform a netting analysis to determine if change will produce a “significant” net increase.

PSD Permitting: Major Modification Applicability (cont'd)

Electric Utility Steam Generating Unit (EUSGU): Under NSR rules still in effect in Region 4, emissions increase from an existing EUSGU undergoing a physical change or change in the method of operation is the difference between actual emissions before the change and representative actual annual emissions after the change (actual-to-actual).

PSD Permitting: Major Modification Applicability (cont'd)

Non-EUSGU:

Under NSR rules still in effect in Region 4, emissions increase from an existing non-EUSGU undergoing a physical change or change in the method of operation is the difference between actual emissions before the change and potential/allowable emissions after the change (actual-to-potential).

Major NSR Permitting: Debottlenecking and Increased Utilization

- Debottlenecking: actual-to-potential emissions change.
- Increased Utilization: the amount of emissions resulting from the increased use of the equipment.

PSD Permitting: Netting

- Emissions changes that are “contemporaneous with the particular change and are otherwise creditable.”
- Creditable increase or decrease: has not been relied on in the issuance of a previous PSD permit.
- Creditable decrease: (1) enforceable; (2) has approximately the same qualitative significance for public health and welfare.

PSD Permitting: Control Technology Requirements

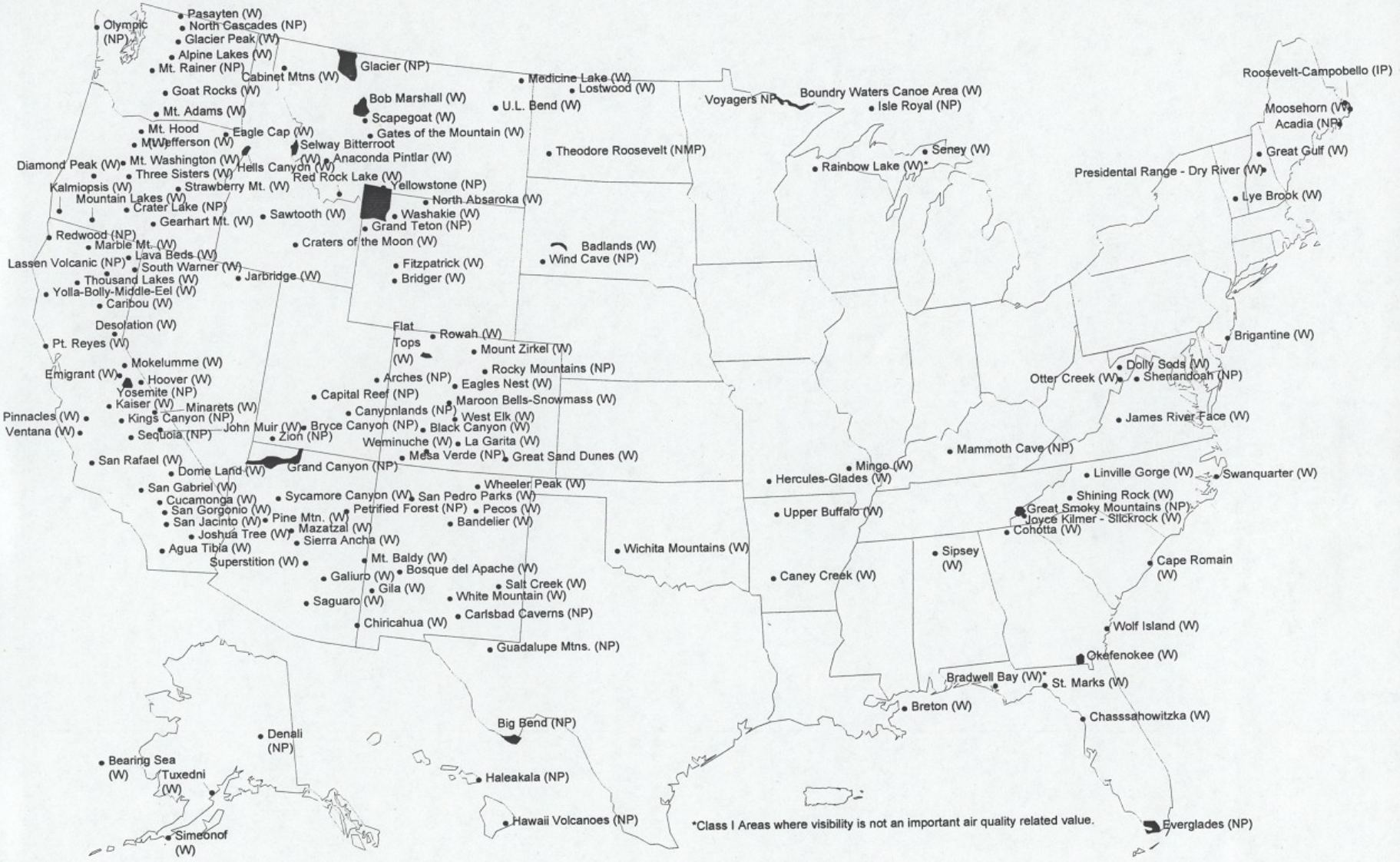
- Best available control technology (BACT) for each “significant” pollutant. Often the most contentious part of PSD permitting.
- “Top-down” concept.
- Factors to elimate a BACT technology option: economics, energy use, environmental impacts.
- Intended that BACT determinations evolve over time to reflect technology advances.

PSD Permitting: Ambient Impact Assessments

- PSD Class I and Class II areas.
- PSD “increments” for Class I and Class II areas: sulfur dioxide, nitrogen dioxide, particulate matter (as PM_{10}).
- Assess whether impact of project for a given pollutant is “significant.”

PSD Permitting: Ambient Impact Assessments (cont'd)

- If project impact significant, assess compliance with PSD increments when applicable (SO_2, NO_2, PM_{10}).
- If project impact significant, asses compliance with NAAQS when applicable (SO_2, NO_2, CO, PM_{10}, Pb). (No impact assessment for ozone.)
- Assess impacts on PSD Class I areas when appropriate (partly dependent on distance): Class I increments and air quality related values (AQRV's).
- Does not require mandatory environmental justice (EJ) impact evaluation, but EPA encourages EJ consideration.



PSD Class I Areas

PSD Permitting: Air Toxics

- Analysis of air toxics impacts not required by federal PSD regulations.
- Some state and local reviewing authorities have their own air toxics requirements that are addressed as part of PSD permitting.

PSD Permitting: Public Review and Appeals

- Draft PSD permit undergoes 30-day public comment period.
- Public hearing may or may not be held (usually not).
- Final permits can be appealed through state/local administrative appeal procedures.
- Final permits issued under SIP-approved programs can not be appealed to the EPA Environmental Appeals Board.

Nonattainment Area NSR Permitting

- Very few examples of major source nonattainment NSR permitting in Region 4 to date.
- Will have many more nonattainment areas after EPA designates nonattainment areas for the 8-hour ozone NAAQS and for the $PM_{2.5}$ NAAQS this year. List and map of likely ozone nonattainment areas at www.epa.gov/air/oaqps/glo/designations/state.htm

Nonattainment Area NSR Permitting: Criteria Pollutant Precursors

- Ozone - EPA-designated precursors are VOC and NO_x.
- $PM_{2.5}$ – EPA-designated precursors will probably be SO_2 and NO_x. Some organic compounds and ammonia may be considered precursors in specific areas depending on demonstrated need.

Nonattainment Area NSR Permitting: Major Source Thresholds

- Major new sources – 100 tpy of nonattainment pollutant or precursor; except lower amount depending on nonattainment area classification.
- Major modification of a major source – significant net emissions increase of nonattainment pollutant or precursor: 40 tpy sulfur dioxide, etc.

Permitting: Control Technology Requirements

- Lowest achievable emission rate (LAER) required for nonattainment pollutant and precursors.
- Rejection of LAER control options can not be based on economics.

Nonattainment Area NSR Permitting: Emissions Offset

- For a construction permit to be issued, proposed emissions increase of nonattainment pollutant (or precursor) has to be accompanied by emissions decrease from existing sources; referred to as emissions offset.
- Amount of required decrease depends on pollutant and classification of the area, but has to be at least one for one (one ton of decrease for each one ton of increase).
- Some reviewing authorities have established “banking” programs to help facilitate acquisition of offsets.

Nonattainment Area NSR Permitting: Additional

- In accordance with Clean Air Act, reviewing authority must provide “an analysis of alternative sites, sizes, production processes” demonstrating that “benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, and modification.”
- Draft permit undergoes 30-day public comment period.
- Procedure to appeal a final permit similar to procedure for PSD permit appeal.

NSR Rule Revisions

Chronology of Recent NSR Rulemaking Activities by EPA

<u>12/31/02</u> - Promulgated final NSR rule revisions with five components primarily applicable to modifications of existing emission sources: definition of baseline actual emissions; actual-to-projected-actual emissions applicability test; Clean Unit test; plantwide applicability limitation (PAL) provision; revised pollution control project exclusion. Reviewing authorities with SIP-approved NSR programs have until 1/2/06 to implement the rules.

<u>12/31/02</u> - Proposed more definitive explanation of what is meant by the routine maintenance, repair, and replacement (RMRR) exemption from

Chronology of Recent NSR Rulemaking Activities by EPA (cont'd)

7/30/03 - Issued notice of reconsideration announcing that EPA would reconsider six specific (and limited) parts of the 12/31/02 final rulemaking.

10/27/03 - Promulgated final NSR rule revision explaining what qualifies as a routine replacement under NSR rules. Rule referred to as the Equipment Replacement Provision (ERP) rule. Deferred rulemaking on what is meant by routine maintenance and repair.

11/7/03 - Issued final decision on reconsideration stating that EPA would not undertake any substantive revisions of the 12/31/02 final

Chronology of Legal Challenges

1/03 - Lawsuits filed with the U.S. Court of Appeals for the District of Columbia (DC Circuit Court) to overturn the 12/31/02 final rules. Lawsuits consolidated into one case.

2/5/03 - Petition to stay the 12/31/02 final rules submitted to DC Circuit Court.

3/6/03 - DC Circuit Court denied the petition to stay the 12/31/02 final rules.

10/27/03 - Lawsuits filed with DC Circuit to overturn the 10/27/03 final ERP rule.

12/24/03 - DC Circuit Court issued a stay of the 10/27/03 final ERP rule. The Court also reiterated that it is not staying the 12/31/02 final rules.

Primary Revisions

- Baseline actual emissions
- Actual-to-projected-actual applicability test
- Plantwide applicablility limitation (PAL)
- Clean Unit test
- Pollution control project exclusion
- Equipment replacement provision (routine replacement) has been stayed by DC Circuit Court

Major NSR Applicability Test

A change is a major modification for an NSR regulated pollutant [new definition] if it causes:

1. **A significant emissions increase for the change by itself.**
2. **A significant net emissions increase at the source.**

“Significant” has the same meaning as in the previous rules, e.g., 40 tpy VOC increase.

NSR Regulated Pollutant

- Criteria pollutants (sulfur dioxide, etc.) and pollutants designated as precursors to criteria pollutants.
- NSPS pollutants (hydrogen sulfide, etc.).
- Certain ozone depleting substances.
- Excludes section 112(b) HAPs and section 112(r) risk management plan pollutants (e.g., ammonia).

Baseline Actual Emissions
for Electric Utility Steam Generating Units (EUSGUs)

- Basically no change from existing rule (called the WEPCO rule). Can use average annual actual emissions during any consecutive 24 months in last 5 years.
- Another period can be used if the reviewing authority determines it to be more representative of normal source operation.
- No adjustments needed for any restrictions added after selected 24-month period.

Baseline Actual Emissions - Non-EUSGUs

- Based on average annual emissions in any consecutive 24-month period during the last 10 years.
- Full 10-year look back available only if adequate data available for selected time period.
- Emissions adjusted for any legally enforceable restrictions added after selected period, e.g., a BACT requirement.

Baseline Actual Emissions (cont'd)

- Can use a different 24-month period for each pollutant.
- For a given pollutant, must use same 24-month period for all emissions units that are part of the change.
- For an existing emissions unit that did not exist during the baseline period, count the emissions rate as zero.
- For a new unit (less than 2 years old), baseline emissions are zero if unit has not yet begun operation and potential to emit if unit has begun operation.

Baseline Actual Emissions (cont'd)

Baseline actual emissions will be used for:

- Determining emissions increases to assess NSR applicability.
- Computing contemporaneous emissions changes for netting.
- Establishing a PAL.

NSR Applicability for Modifications

- Old applicability test for non-EUSGUs based on difference between past actual emissions and future potential emissions.
- New applicability test for non-EUSGUs based on difference between baseline actual emissions and projected actual emissions.
- Applicability test for EUSGUs will remain based on difference between baseline actual emissions and projected actual emissions.

Replacement Units

- Actual-to-projected-actual test also applies to replacement units (based on discussion in 12/31/02 rules revision preamble; not yet in rules text).

- Baseline actual emissions for a replacement unit equated to baseline actual emissions of unit that will be replaced.

Projected Actual Emissions Calculation

- Source owner projects actual annual emissions for the 5-year period after the change, or

- Source owner projects actual annual emissions for a 10-year period after the change if the change involves an increase in an emissions unit’s potential to emit or design capacity.

Projected Actual Emissions Calculation (cont'd)

Projected emissions rate is the product of:

- Hourly emissions rate based on post-change operational capability, taking into account legally enforceable restrictions affecting hourly emissions; and

- Projected level of annual utilization based on historic utilization rate and information about likely post-change utilization.

Projected Actual Emissions Calculation (continued)

- Source owner may adjust the projection to exclude any portion of the emissions increase that the changed unit could have accommodated during the 24-month baseline period and that is unrelated to the change.

- This includes, but is not restricted to, adjustment for demand growth.

Pre-Construction Notification

- Owners of non-EUSGUs that calculate no significant increase for a modification do not provide notification to reviewing authority (unless required by a state/local minor source regulation).

- Owners of EUSGUs that calculate no significant net increase for a modification provide pre-construction notification but do not have to obtain approval from the reviewing authority (unless required by a state/local minor source regulation).

Recordkeeping

- Recordkeeping requirements apply if source owner uses an actual-to-projected-actual test and there is a reasonable possibility that a change could result in a significant emissions increase even if the expected increase is not significant.
- If source owner uses post-change potential emissions rather than projected actual emissions, recordkeeping requirements do not apply.

Recordkeeping (cont'd)

- Recordkeeping consists of estimating annual emissions of any regulated NSR pollutant that could increase as a result of the project and maintaining records for 5 years following resumption of regular operation, or 10 years if project causes an increase in potential to emit or design capacity.

- Source owner must make required records available for review if requested by reviewing authority or the general public.

Reporting

- Owners of EUSGUs report annually for 5 years (or 10 years if increase in PTE or capacity) at the end of each year following resumption of normal operation.

- Owners of non-EUSGUs only report during the 5 years (or 10 years if increase in PTE or capacity) following resumption of normal operation if (1) annual emissions exceed baseline actual emissions by a significant amount and (2) annual emissions differ from pre-construction projections.

New NSR Applicability Test – Additional Comment

Baseline actual emissions and projected actual emissions include fugitive emissions (regardless of emission source category) and emissions during startup, shutdown, and malfunction. [Note: Including fugitive emissions for all source categories has been challenged by an industrial group.]

Plantwide Applicability Limitation (PAL)

- Purpose: once a PAL is established, source owner can add new units and modify existing units without triggering major NSR so long as PAL not exceeded.
- State/local minor source permitting requirements may still apply.
- Based on actual emissions for entire source. EPA still considering whether to propose an allowables based PAL in addition to actuals based PAL.

PAL (continued)

- Calculate actual emissions for source using baseline actual emissions approach, with adjustments under certain circumstances. For example, emissions from units added after baseline date are potential emissions.
- PAL is pollutant specific. Need separate PAL for each pollutant.
- Term of PAL is 10 years. Can be renewed.

Clean Unit Test

- Purpose: similar to a PAL but for a single emissions unit. Once unit is designated a Clean Unit, owner can modify unit without triggering major NSR so long as Clean Unit emissions limit not exceeded.
- Existing units can be designated Clean Units as well as future new units.
- Term of Clean Unit status depends on various factors, but no greater than 10 years. Can be renewed.
- Pollutant specific. Need separate Clean Unit designation for each pollutant.

Pollution Control Project (PCP) Exclusion

- Extends existing WEPCO provisions to all source types, not just EUSGUs. Supersedes 1994 EPA guidance on PCPs.
- If considered a PCP, adding controls to an existing emissions unit is not subject to major NSR even if significant collateral pollutant increase in emissions occurs.
- To qualify for PCP, must be “environmentally beneficial” and meet “cause or contribute” criterion.
- Rules contain a list of control types considered PCP (i.e., environmentally beneficial) by definition. Other types can be deemed PCP through case-by-case review.

New Equipment Replacement Provision (ERP)

- Changes subject to NSR permitting do not include “routine maintenance, repair and replacement.”
- The word “routine” was not previously explained in NSR regulations.
- Several NSR enforcement cases arose over whether past changes were routine or not. Includes electric utility enforcement cases.
- Now have a new regulatory provision on routine replacement. Provisions for routine maintenance and repair deferred.

ERP - Summary

Replacement of a component(s) in a process unit with a functionally equivalent component(s) is routine if:

- fixed capital cost of replacement component does not exceed 20% of the replacement value of the process unit.
- replacement does not change the basic design parameters of the process unit.
- replacement does not cause enforceable limitations to be exceeded.

ERP - Process Unit

Collection of structures and/or equipment that processes, assembles, applies, blends, or otherwise uses material inputs to produce or store an intermediate or a completed product. A source may contain more than one process unit, and a process unit may contain more than one emissions unit.

ERP - Process Unit (cont,d)

Process units defined for electric generating facility, petroleum refinery, and incinerator. For example, a coal-fired electric generating facility process unit includes coal handling equipment, pulverizers or coal crushers, feedwater heaters, ash handling, boiler, burners, turbine-generator set, condenser, cooling tower, water treatment system, air preheaters, stack, and operating control systems; but does not include post-combustion pollution control devices.

ERP - Functionally Equivalent Component

Means a component that serves the same purpose as the replaced component. Does not have to be identical to the replaced component.

ERP – Fixed Capital Cost of Replacement Component

Means the capital needed to provide all the depreciable features and is based on calculation of total capital investment taking into account purchased equipment costs, direct installation costs, and indirect installation costs (in other words, the calculation method in the *EPA Air Pollution Control Cost Manual*).

ERP - Replacement Value of Process Unit

- Fixed capital cost of process unit (see definition of fixed capital cost of replacement component), or current appraised value of process unit.
- [Alternative] Insurance value (of complete replacement)
- [Alternative] Investment value adjusted for inflation.
- [Alternative] Another accounting procedure if based on Generally Accepted Accounting Principles.
- Notice must be submitted to reviewing authority if source owner uses an alternative.

ERP - Basic Design Parameters (BDPs)

- Steam electric generating facility BDP - maximum hourly heat input and maximum hourly fuel consumption rate, or maximum hourly electric output rate and maximum steam flow rate, or an alternative approved by reviewing authority.
- Other facility BDP - maximum rate of fuel or heat input, or maximum rate of material input, or maximum rate of product output, or an alternative approved by reviewing authority.
- Efficiency of a process unit is not a BDP. EPA does not want to inhibit efficiency improvements.

Routine Replacement – Alternative Approach

As an alternative or as a supplement to the ERP approach, source owners can use the older four-factor, case-by-case approach (nature and extent, purpose, frequency, cost).

Final Note on NSR Rule Revisions

A state/local reviewing authority can adopt rules that differ from EPA rule provisions provided that the reviewing authority submits an evaluation demonstrating “equivalency” and EPA concurs.